

DIESELS



MARINE AND
STATIONARY

W A S H I N G T O N I R O N W O R K S

SEATTLE, U. S. A.

DEPENDABLE DIESEL POWER

for both M A R I N E

and S T A T I O N A R Y use

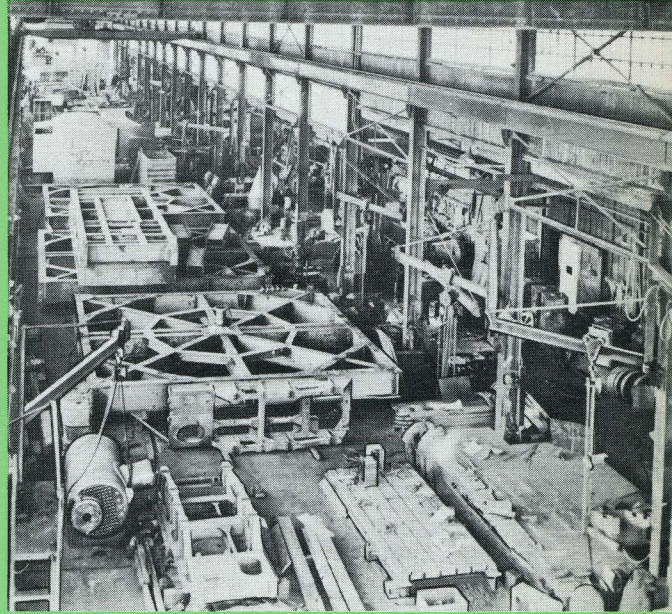
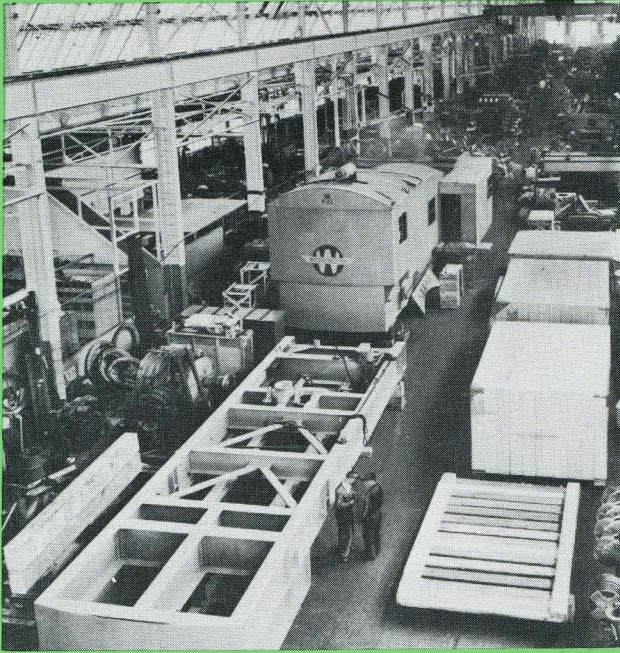
FROM 90 TO 1500 B.H.P.



W A S H I N G T O N I R O N W O R K S

Cable Address "FRINK" • Tel. EL. 1292
1500 SIXTH AVENUE, SOUTH
SEATTLE 4, WASHINGTON

PHOTOS IN PLANT OF WASHINGTON IRON WORKS





T H E P L A N T

SINCE 1882 the Washington Iron Works has been manufacturing heavy duty equipment for marine use, for logging, mining and allied industries. The management of the concern assures its customers of the same policy, established when the firm was founded, of high quality, of service, and an understanding of the users' problems.

The plant, occupying almost eight acres, is a complete self-contained facility with a steel and iron foundry, pattern shop, steel fabricating department, forge and machine shop, equipped with all the necessary precision machinery to handle efficiently production of the most delicate parts or pieces of enormous size and weight.

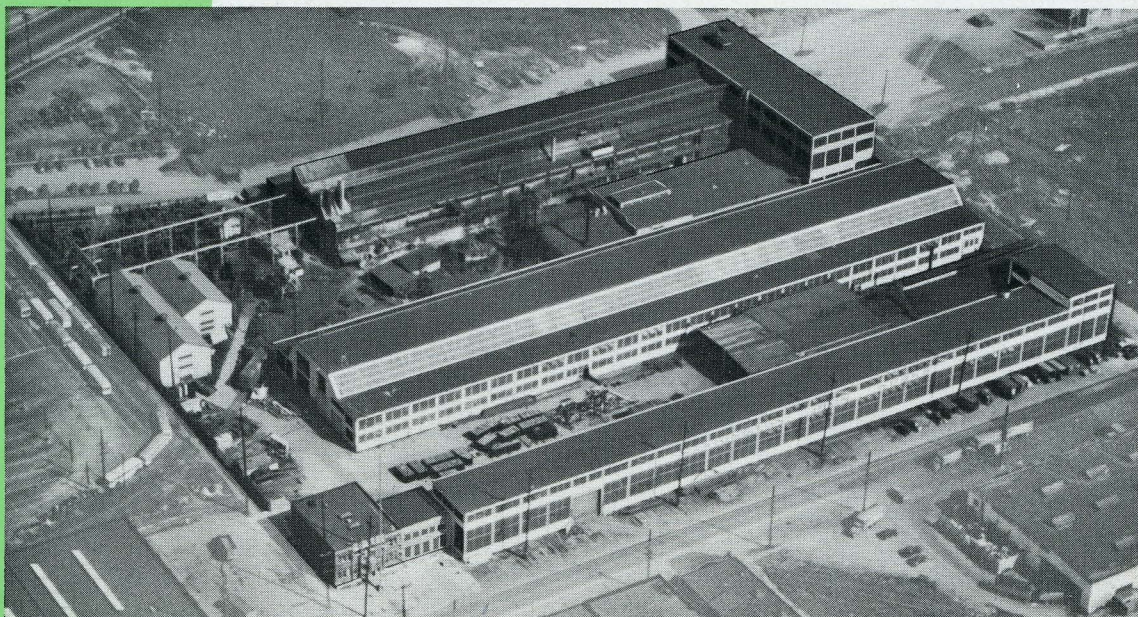
The shop employees are mechanics highly skilled in their trades with long experience records with the company.

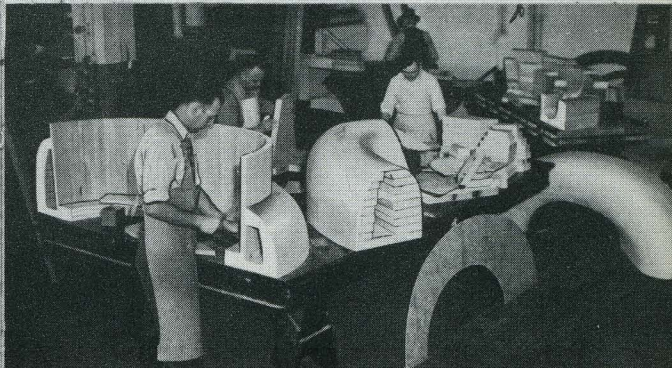
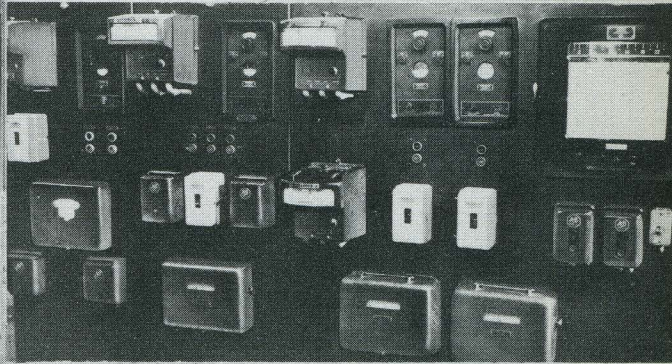
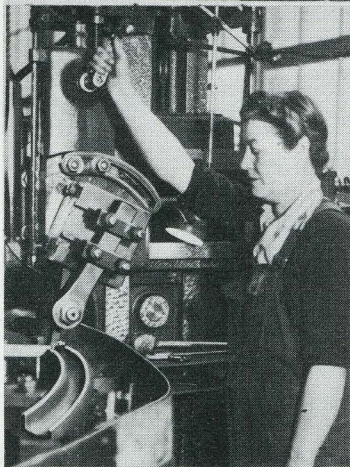
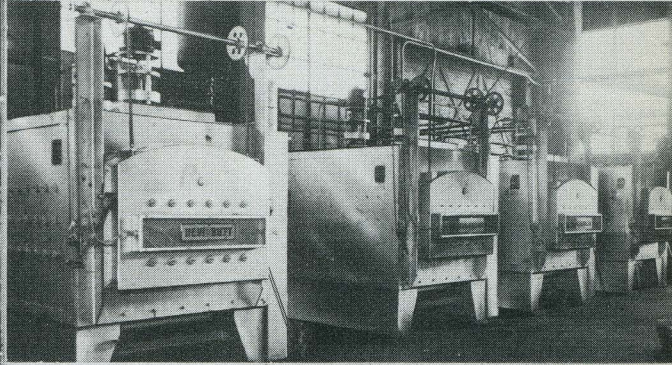
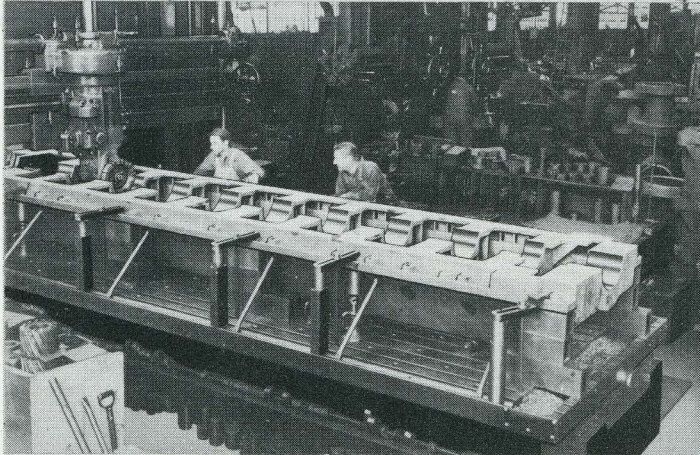
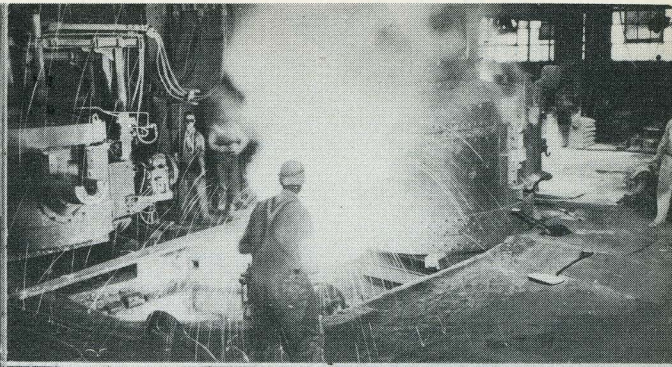
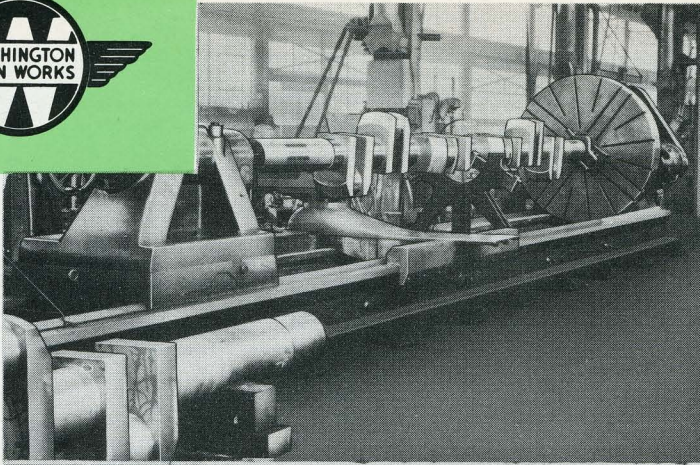
The combined efforts of the management, the engineers, and the workmen, together with scientific control by the metallurgical laboratory, assure the customer of a high quality product.

The service and parts department maintains a high standard of cooperation with the user of Washington equipment.

In 1921, Washington's first diesel engine was finished and sold . . . the result of long study and careful planning. From the first, Washington built Dependable Diesel Power.

Today Washington Diesel Engines are in service from Northern Alaska to the Tropics doing a multiplicity of jobs: the propulsion of ships, driving generator sets in marine and stationary service, furnishing power for logging, dredging and crane equipment. In fact, wherever heavy duty, slow speed Dependable Diesel Power is needed, a Washington is doing the job.



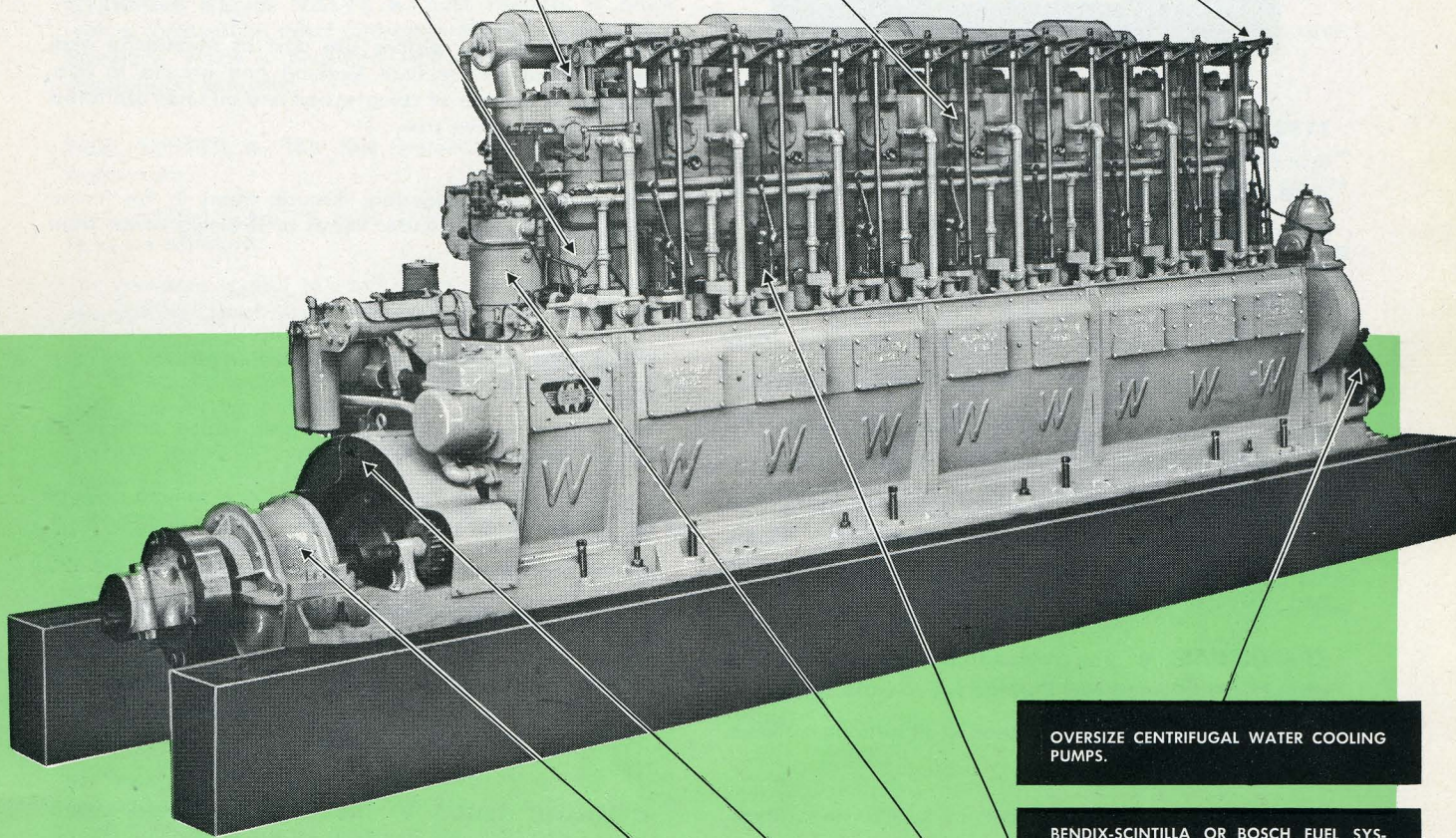


VALVE MOTION OPEN FOR EASY INSPECTION AND MAINTENANCE.

LARGE INSPECTION DOORS ON BOTH SIDES OF FRAME. CLEANOUT PLATES ON ALL CYLINDERS, CYLINDER HEADS AND EXHAUST MANIFOLD.

INTERCHANGEABLE, CAGED, HEAT RESISTING STEEL INTAKE AND EXHAUST VALVES. WATER COOLED CAGES ON LARGER SIZES.

INDIVIDUAL CYLINDERS ON LARGER SIZES AND IN BLOCKS OF TWO ON SMALLER ENGINES.



OVERSIZE CENTRIFUGAL WATER COOLING PUMPS.

BENDIX-SCINTILLA OR BOSCH FUEL SYSTEM. PUMPS ARRANGED SO NO FUEL CAN GET INTO LUBRICATING OIL.

AIR COMPRESSOR BUILT INTO ALL ENGINES. EXTRA WATER PUMPS, POWER TAKE OFF AND OTHER ACCESSORIES AVAILABLE.

FLYWHEEL OF DIRECT REVERSING ENGINE AT AFTER END AHEAD OF THRUST BEARING.

DOUBLE TAPERED ROLLER TYPE THRUST BEARING PRESSURE LUBRICATED. THRUST SHAFT SEPARATE FROM MAIN CRANK-SHAFT.

GENERAL SPECIFICATIONS

WASHINGTON DIESEL ENGINES

TYPE ● Washington Diesel Engines are engineered and built for both Stationary and Marine uses—not just a standard engine converted and adapted for a particular use.

Washington Diesel Engines are of a heavy duty type . . . slow speed . . . four cycle . . . solid injection . . . conservatively rated.

The engines are simple in design with all parts easily accessible.

BASE ● The base is cast of Meehanite Iron and is designed for maximum strength with a minimum of weight.

It is made in one piece with the final machining being done with one set up, which assures perfect alignment of the top surfaces and the bearing seats, giving a balanced and a smoothly performing engine.

CRANKSHAFT ● The crankshaft is a one-piece forging, accurately machined and balanced.

It is drilled for pressure lubrication to all bearing surfaces.

There are no overhung drives.

The shaft meets all requirements of A. B. S. and Lloyds.

FRAMES ● The frame is of the "box section type," cast of Meehanite Iron and is so designed that firing stresses are taken by through bolts to the base casting and not by studs.

MAIN BEARINGS ● The main bearings are heavy duty type, with roll out shells, babbit lined. Caps are held down by through bolts, not studs.

CRANK BEARINGS ● The crank bearings are heavy duty Marine type, babbit lined, separate from rods.

CONNECTING RODS ● The connecting rods are designed for a maximum of strength with a minimum of weight, with long centers and a solid top end with pressed in bushing.

They are drilled for pressure lubrication to the wrist pin.

CYLINDER LINERS ● The cylinder liners are cast of a close grained Meehanite Iron, with the hardness exactly controlled.

They are of a symmetrical section, heat-treated before final finishing, and ground to size.

WRIST PINS ● The wrist pins are the free floating type, hollow, hardened and ground to size.

PISTONS ● The pistons are cast of Meehanite Iron, heat-treated before final finishing and ground to size. The correct number of compression and oil rings are fitted for each respective size.

The pistons are removable through doors in the frame without taking off cylinder heads or draining water from engine.

CYLINDER JACKETS ● The cylinder jackets are cast Meehanite Iron.

There is a large circulating water space completely around the liner.

Clean out plates to the water space are on both sides of the jackets on all sizes of engines.

On the smaller sizes of engines, the jackets are cast in pairs.

On the larger sizes of engines, there are separate jackets for each cylinder.

Jackets in all cases are held down by through bolts to engine base.

CYLINDER HEADS ● The cylinder heads are cast of Meehanite Iron and carefully heat-treated.

They are individual for each cylinder on all sizes of engines and have large circulating water spaces and clean-out openings.

Water enters the head from the jacket through a number of passages, each sealed with a rubber grommet. This assures an even distribution of water in the head and prevents hot spots. There is a copper asbestos gasket between the cylinder head and the liner to seal firing and compression loads.

Cylinder heads do not have to be removed to take out pistons.

MAIN VALVES ● The valves are of forged heat resisting steel.

The intake and exhaust valves are interchangeable and are guided at the top to reduce side pressure on the stems.

On all sizes of engines, except 9" bore, valves are in cages, thereby making it unnecessary to remove the cylinder head to change valves.

On the larger sizes of engines, the exhaust valve cage is water cooled.

On all sizes of engines, all valves are fitted with removable valve stem bushings.

AIR STARTING VALVES ● The air starting valves are mounted in cages and are of the simple spring closing type, automatically operated by the air distribution valve.

They are completely removable without dismantling air piping.

CYLINDER RELIEF VALVE ● Each cylinder is fitted with a combination relief and compression release valve assembly, which is provided with a connection for a compression indicator.

FUEL SYSTEM ● The fuel system is of Scintilla or Bosch make.

An individual pump for each cylinder is driven directly from the camshaft.

The governor control to each pump, except the number one cylinder which is permanently keyed, is individually adjustable.

The fuel pump tappet guides are equipped with traps to catch any leakage of fuel oil.

A single spring loaded type fuel valve is located in the center of each cylinder head.

Leakage drains from fuel valves and fuel pumps flow into a common return manifold.

CAMSHAFT ● The cams are forged steel, heat-treated, and hardened, with all cams precision ground from a master cam.

The camshaft is mounted on the engine frame and is gear driven from the crankshaft.

All cams are fitted solid to the camshaft except those operating the fuel pumps, which are adjustable on the shaft for more accurate timing of fuel injection.

Valve tappets have large, hardened rollers, and the tappet guides are separate and removable.

The push rods are tubular in construction with ball and socket connections on both ends.

The rocker arms are fitted with rollers to contact valves, thereby reducing side pressure and wear on the valve stems.

LUBRICATING SYSTEM ● Forced feed lubrication is provided to all main bearings, crank bearings and wrist pins, thrust bearing and governor.

Oil is fed to all cylinder liners from a mechanical lubricator which assures proper lubrication even at idling or low speeds.

All pump drives are splash lubricated from the engine base.

COOLING SYSTEM ● Ample water space for cooling water is provided to all cylinders, cylinder heads and exhaust manifolds.

There are large clean-out doors for removal of accumulated sediment in the water spaces.

EXHAUST MANIFOLD ● The exhaust manifold is water jacketed and is fitted with large clean-out plates for water passages.

It is not necessary to remove the manifold to take off cylinder heads.

INTAKE MANIFOLD ● The intake manifold is of steel and is fitted with built-in silencers.

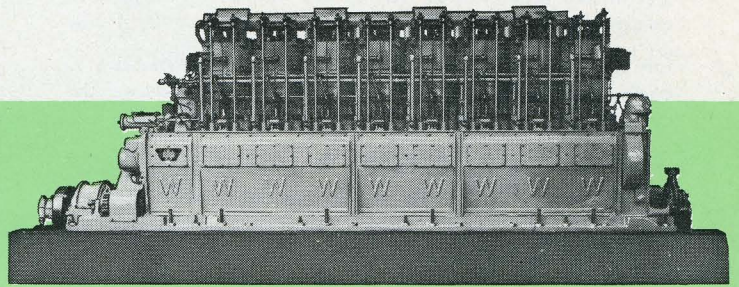
At the option of the customer, the manifold will be furnished for connection to an outside supply or to an air filter.

STARTING ● Washington Diesels are started by compressed air of from 100 to 300 pounds per square inch pressure.

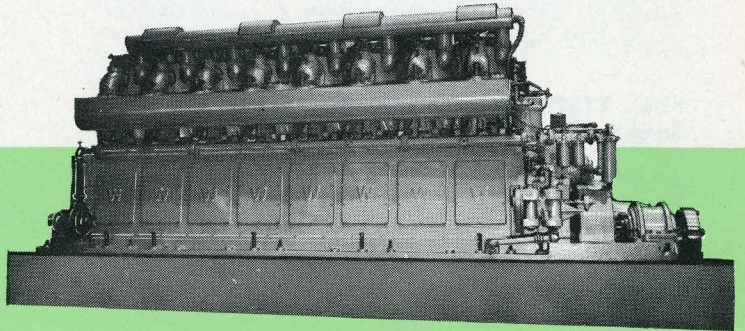
They will start in the coldest weather without the use of torches or electric plugs.



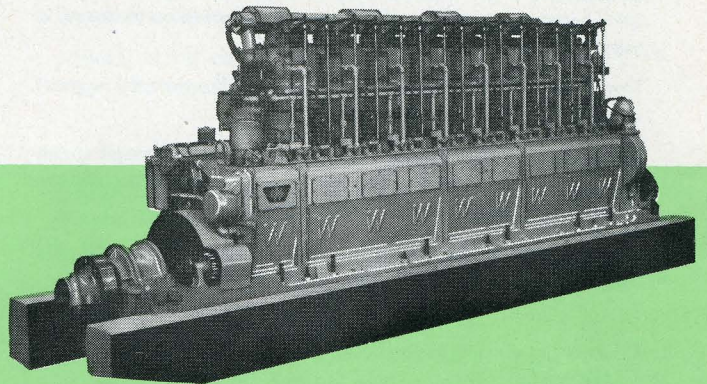
**Operating or control side of Eight
Cylinder Direct Reversing Marine
Engine**



**Manifold side of Eight Cylinder
Direct Reversing Marine Engine**



**Typical Direct Reversing Marine
Engine . . . available as standard
or supercharged and from five to
eight cylinders**



SPECIFICATIONS MARINE TYPE

WASHINGTON DIESEL ENGINES

TYPE ● Two types of Washington Diesel Engines are built for direct propulsion of ships: the Direct Reversing type, with five or more cylinders, and the Reverse Gear type, with three or four cylinders.

For Ferry Boat use, there is also manufactured the double ended type, either direct reversing or fitted with a clutch at each end of the engine.

DIRECT REVERSING ● The reversing of the engine is accomplished by a double set of cams on a sliding camshaft. The camshaft is shifted by an air cylinder.

The controls are interlocked so that the shaft cannot be shifted unless the fuel pumps are unloaded and the engine cannot be started unless the camshaft is in its proper position.

The engine can be reversed quickly and without the use of a brake.

REVERSE GEAR ● The reverse gear used on the three and four cylinder engines is designed and manufactured by the Washington Iron Works.

It is a heavy duty planetary type with a multiple disc type clutch and over 100% reverse speed.

The gear is enclosed and is pressure lubricated by the main engine system.

Control of the reverse gear and clutch is by a hand wheel or by an air mechanism which is furnished at additional cost.

SAILING CLUTCH ● A one-way or sailing clutch can be furnished with Direct Reversing engines where it is desired to drive winches or other equipment from the engine.

The clutch is mounted between the flywheel and the thrust bearing, inside the engine base.

THRUST BEARING ● The Thrust Bearing is mounted on the main engine base.

It is double tapered roller type and lubricated from the engine pressure system.

Cooling is not required because of the high efficiency of this type of bearing.

The thrust shaft, being a separate unit, may be removed from the engine without disturbing the crankshaft or the flywheel.

FLYWHEEL ● The Flywheel is the solid web type mounted on a coupling and easily removable.

On the Reverse Gear type engines, the flywheel is on the forward end of the engine. On the Direct Reversing engines it is mounted on the after end between the last main bearing and the thrust bearing.

Provisions have been made on all engines for "barring over" the engine.

GOVERNOR ● A ball bearing vertical type governor controls all speeds of the engine.

ATTACHED EQUIPMENT ● The following is standard equipment:

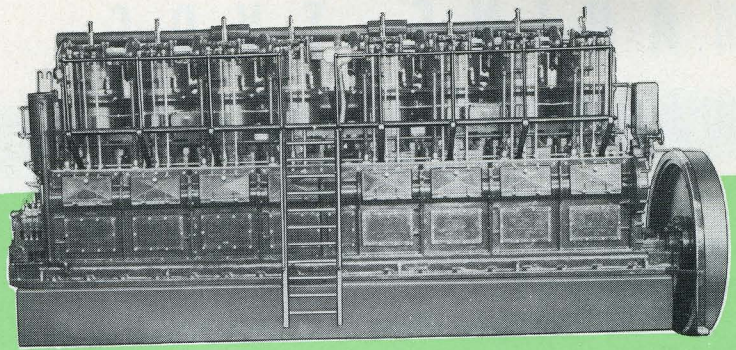
- Air Compressor
- Double Lubricating Oil Pumps
- Cooling Water Pump
- Duplex Fuel Oil Filters
- Fuel Transfer Pump

At option of the customer the following can be furnished:

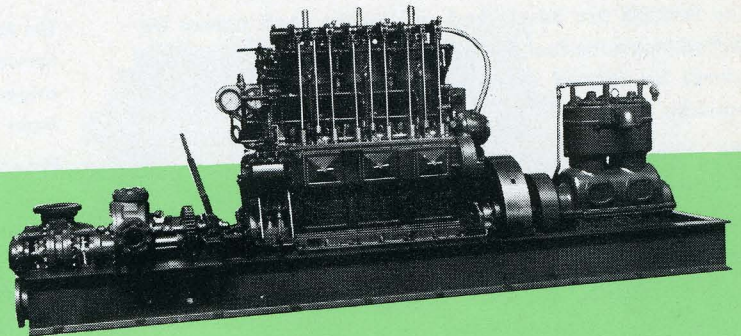
- Heat Exchanger and Pump
for Fresh Water Cooling
- Bilge Pump (Plunger Type)
- Exhaust Pyrometer
- Tachometer
- Power Take-off Clutch
- Lubricating Oil and Cooling Water Alarms



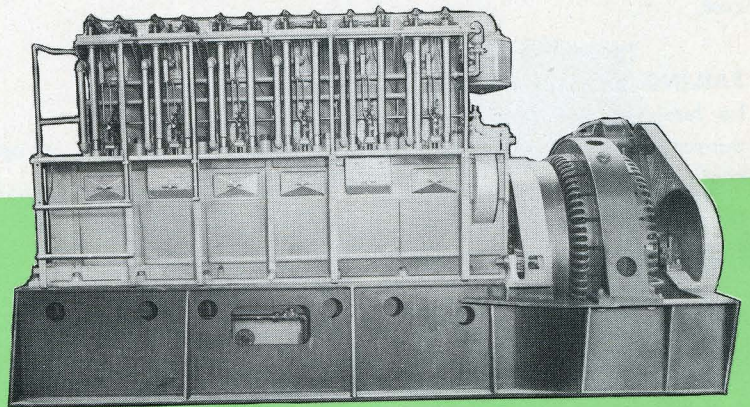
**1000 B.H.P. Stationary Type
Engine installed in an Alaskan
Power Plant**



**Three Cylinder 90 H.P. Engine
driving air compressor from front
end and two cargo oil pumps from
aft end. Installation was made
on an Inland Water Freighter**



**Six Cylinder 465 H.P. Stationary
Type Engine with direct connect-
ed 300 K.W. 2300 Volt Gener-
ator with V-belt driven exciter**



SPECIFICATIONS STATIONARY TYPE

WASHINGTON DIESEL ENGINES

TYPE ● Washington Diesel Engines are made for driving all types of equipment. They can be used for auxiliary service aboard ship and main propulsion through electric drive. They can be fitted for portable heavy duty use or in main power plants.

FLYWHEEL ● The Flywheel is of the solid web type fastened with fitted bolts to a coupling mounted on the crankshaft.

A suitable size and weight of flywheel is furnished for the installation to provide the proper regulation of speed and eliminate critical speeds.

The flywheel is generally located between the engine and the driven unit.

Power may be taken off either or both ends of the engine.

GOVERNOR ● Various types of governors are furnished with Washington Diesels, depending on the type of drive and the regulation required.

THRUST BEARING ● A Thrust Bearing is built into the crankshaft bearings to take care of normal thrust encountered on stationary type engines.

ATTACHED EQUIPMENT ● The following is standard equipment:

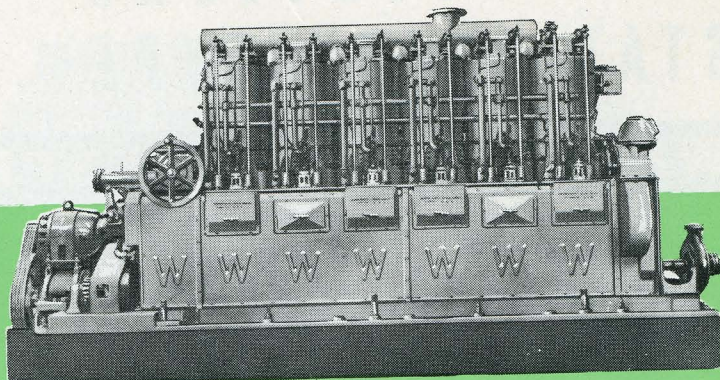
- Cooling Water Pump
- Lubricating Oil Pump
- Fuel Transfer Pump
- Cylinder Lubricator
- Duplex Fuel Oil Filter

At the option of the customer the following can be furnished:

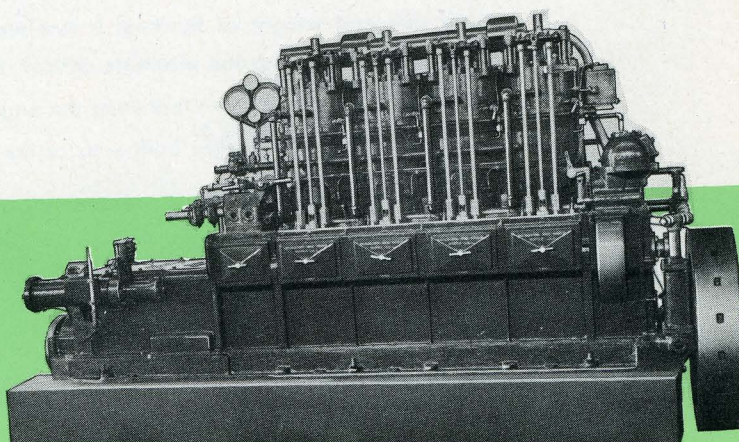
- Air Compressor
- Heat Exchanger and Pump for Fresh Water Cooling
- Exhaust Pyrometer
- Alarm System for Lubricating Oil and Cooling Water
- Tachometer
- Sub-base
- Extension Shaft, Bearings and Clutches
- Generators



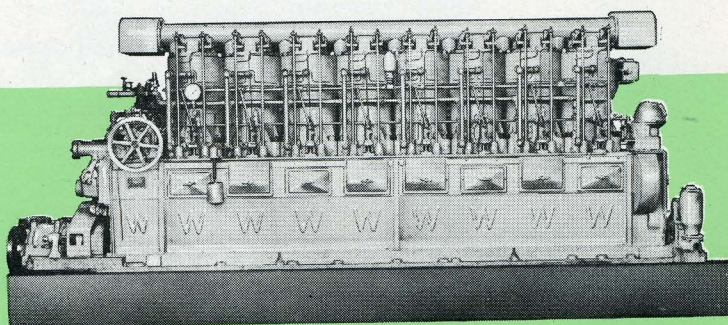
**Operating side of Six Cylinder
375 H.P. Direct Reversing Marine
Engine. Generator mounted above
thrust bearing for ships service**



**Operating side of Four Cylinder
Marine Engine equipped with
electro-pneumatic control on
reverse gear**



**Operating side of Eight Cylinder
500 H.P. Direct Reversing Marine
Engine**



CAPACITY RATINGS

WASHINGTON DIESEL ENGINES

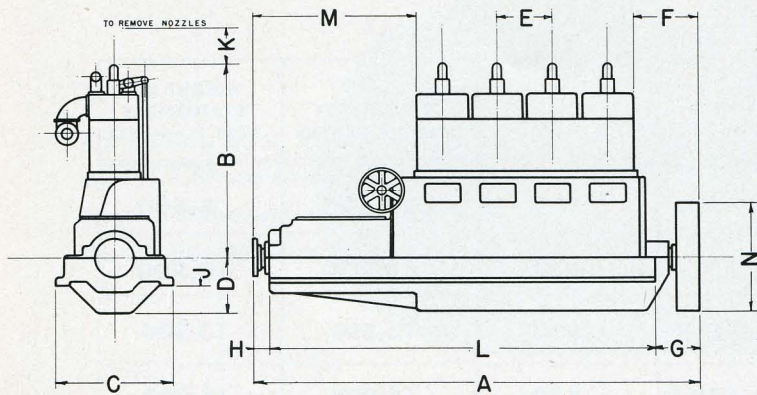
MODEL NUMBER	B. H. P.*	NO. CYLS.	BORE AND STROKE	R. P. M.	WEIGHT DRY MARINE ENGINE	WEIGHT DRY STATIONARY LESS FLYWHEEL
3-125	90	3	9" x 12½"	400	13,500	8,600
4-125	120	4	9" x 12½"	400	14,700	10,300
5-125	150	5	9" x 12½"	400	16,500	13,500
6-125	200	6	9" x 12½"	450	18,000	15,000
8-125	270	8	9" x 12½"	450	21,000	18,500
3-13	120	3	10¼" x 13½"	360	15,800	10,450
4-13	160	4	10¼" x 13½"	360	18,500	13,000
6-13	260	6	10¼" x 13½"	390	23,000	18,000
8-13	350	8	10¼" x 13½"	390	26,500	25,000
4-15	200	4	11½" x 15"	327	27,000	22,000
6-15	330	6	11½" x 15"	360	31,500	27,000
8-15	440	8	11½" x 15"	360	40,500	36,000
6-160	400	6	12¾" x 16"	360	42,000	38,000
8-160	550	8	12¾" x 16"	360	53,000	49,000
6-18	500	6	14½" x 18"	300	62,500	55,000
8-18	665	8	14½" x 18"	300	80,000	73,000
6-20	640	6	16" x 20"	277	82,000	73,000
8-20	850	8	16" x 20"	277	105,000	96,000

* Ratings shown above are for standard engines. Ratings for supercharged engines are available upon request to factory.



GENERAL

WASHINGTON



REVERSE GEAR ENGINES

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N
3C125	10' 7 ⁷ / ₈ "	5' 6"	3' 1 ¹ / ₂ "	16 ¹ / ₂ "	14 ¹ / ₂ "	2' 3"	11 ¹ / ₂ "	4"	4"	8"	9' 4 ³ / ₈ "	4' 6"	42 ¹ / ₂ "
4C125	11' 10 ³ / ₈ "	5' 6"	3' 1 ¹ / ₂ "	16 ¹ / ₂ "	14 ¹ / ₂ "	2' 3"	11 ¹ / ₂ "	4"	4"	8"	10' 6 ⁷ / ₈ "	4' 6"	42 ¹ / ₂ "
3C13	11' 4 ³ / ₈ "	5' 10 ¹ / ₄ "	3' 4"	18"	16 ¹ / ₂ "	2' 4"	12"	4"	5"	3"	10' 0 ³ / ₈ "	4' 7"	42 ¹ / ₂ "
4C13	13' 1 ¹ / ₂ "	5' 10 ¹ / ₄ "	3' 4"	18"	16 ¹ / ₂ "	2' 4"	12"	4 ¹ / ₄ "	5"	3"	11' 9 ¹ / ₄ "	5' 0"	42 ¹ / ₂ "
4C15	14' 1"	6' 6 ¹ / ₄ "	3' 10"	21"	18 ¹ / ₂ "	2' 6 ³ / ₄ "	13"	4 ¹ / ₂ "	5"	4"	12' 7 ¹ / ₂ "	5' 0"	46"

DIRECT REVERSING ENGINES WITH SAILING CLUTCH

(SEE DRAWINGS ON PAGE 15)

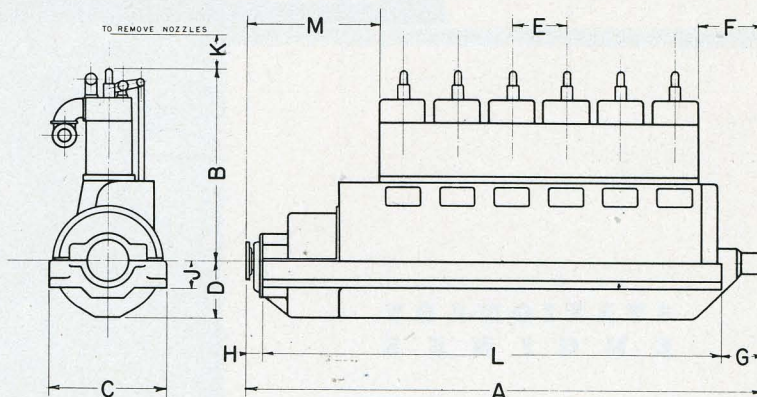
MODEL	A	B	C	D	E	F	G	H	J	K	L	M
5R125C	12' 5 ¹ / ₄ "	5' 6"	3' 1 ¹ / ₂ "	16 ¹ / ₂ "	14 ¹ / ₂ "	23"	7 ¹ / ₂ "	4 ¹ / ₂ "	4"	8"	11' 5 ¹ / ₄ "	4' 2"
6R125C	13' 7 ³ / ₄ "	5' 6"	3' 1 ¹ / ₂ "	16 ¹ / ₂ "	14 ¹ / ₂ "	23"	7 ¹ / ₂ "	4 ¹ / ₂ "	4"	8"	12' 7 ³ / ₄ "	4' 2"
8R125C	16' 1 ³ / ₄ "	5' 6"	3' 1 ¹ / ₂ "	16 ¹ / ₂ "	14 ¹ / ₂ "	24"	8 ¹ / ₂ "	4 ¹ / ₂ "	4"	8"	15' 0 ³ / ₄ "	4' 2"
6R13C	14' 9 ¹ / ₄ "	5' 10 ³ / ₄ "	3' 4"	18 ¹ / ₄ "	16 ¹ / ₂ "	24"	8"	4 ¹ / ₂ "	5"	3"	13' 8 ³ / ₄ "	4' 2 ¹ / ₂ "
8R13C	18' 0 ³ / ₄ "	5' 10 ³ / ₄ "	3' 4"	18 ¹ / ₄ "	16 ¹ / ₂ "	24"	8"	6 ¹ / ₄ "	5"	3"	17' 0 ¹ / ₄ "	4' 9"
6R15C	17' 2 ³ / ₄ "	6' 6 ³ / ₄ "	3' 10"	21"	18 ¹ / ₂ "	2' 1 ¹ / ₂ "	8"	6 ¹ / ₂ "	5"	4"	16' 0 ¹ / ₄ "	5' 6"
8R15C	20' 10"	6' 6 ³ / ₄ "	3' 10"	21"	18 ¹ / ₂ "	2' 3 ¹ / ₂ "	10"	8 ¹ / ₄ "	5"	4"	19' 3 ³ / ₄ "	6' 0"
6R160C	18' 10 ³ / ₄ "	7' 1"	4' 2"	21 ¹ / ₂ "	20 ¹ / ₄ "	2' 6"	8 ¹ / ₄ "	8 ¹ / ₄ "	5"	4"	17' 6 ¹ / ₄ "	6' 0"
8R160C	22' 3 ¹ / ₄ "	7' 1"	4' 2"	21 ¹ / ₂ "	20 ¹ / ₄ "	2' 6"	8 ¹ / ₄ "	8 ¹ / ₄ "	5"	4"	20' 10 ³ / ₄ "	6' 0"

DIMENSIONS

DIESEL ENGINES



**D I R E C T
R E V E R S I N G
E N G I N E S**

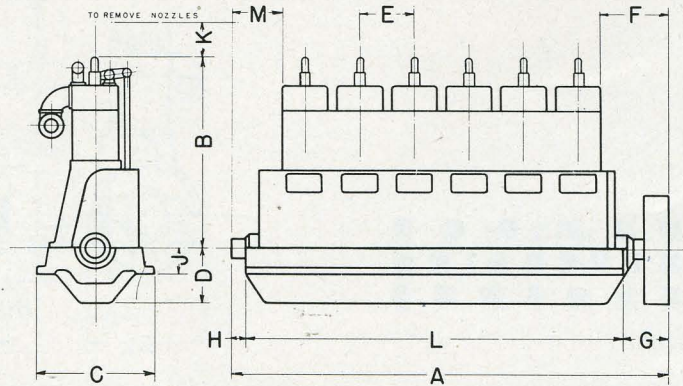


MODEL	A	B	C	D	E	F	G	H	J	K	L	M
5R125	11' 4 1/2"	5' 6"	3' 1 1/2"	16 1/2"	14 1/2"	23"	7 1/2"	4 1/2"	4"	8"	10' 4 1/2"	3' 1 1/2"
6R125	12' 7"	5' 6"	3' 1 1/2"	16 1/2"	14 1/2"	23"	7 1/2"	4 1/2"	4"	8"	11' 7"	3' 1 1/2"
8R125	15' 1"	5' 6"	3' 1 1/2"	16 1/2"	14 1/2"	24"	8 1/2"	4 1/2"	4"	8"	14' 0"	3' 1 1/2"
6R13	13' 9 3/4"	5' 10 3/4"	3' 4"	18 1/4"	16 1/2"	24"	8"	4 1/2"	5"	3"	12' 9 1/4"	3' 3 1/4"
8R13	16' 10 1/2"	5' 10 3/4"	3' 4"	18 1/4"	16 1/2"	24"	8"	6 1/4"	5"	3"	15' 8 1/4"	3' 7"
6R15	15' 9"	6' 6 3/4"	3' 10"	21"	18 1/2"	2' 1 1/2"	8"	6 1/2"	5"	4"	14' 6 1/2"	4' 0"
8R15	19' 5 1/4"	6' 6 3/4"	3' 10"	21"	18 1/2"	2' 3 1/2"	10"	8 1/4"	5"	4"	17' 11"	4' 6"
6R160	17' 4 3/4"	7' 1"	4' 2"	21 1/2"	20 1/4"	2' 6"	8 1/4"	8 1/4"	5"	4"	16' 0 1/4"	4' 6"
8R160	20' 9 1/4"	7' 1"	4' 2"	21 1/2"	20 1/4"	2' 6"	8 1/4"	8 1/4"	5"	4"	19' 4 3/4"	4' 6"
6R18	20' 5 1/4"	7' 10 1/2"	4' 8"	2' 2"	23 1/2"	2' 11"	12 1/2"	8 1/4"	6"	4 1/4"	18' 8 1/2"	5' 4"
8R18	24' 4 1/4"	7' 10 1/2"	4' 8"	2' 2"	23 1/2"	2' 11"	12 1/2"	8 1/4"	6"	4 1/4"	22' 7 1/2"	5' 4"
6R20	22' 0 1/2"	8' 11"	5' 1"	2' 2"	2' 4 1/2"	2' 9"	9"	8 1/4"	6"	5"	20' 7 1/4"	4' 8"
8R20	26' 9 1/2"	8' 11"	5' 1"	2' 2"	2' 4 1/2"	2' 9"	9"	8 1/4"	6"	5"	25' 4 1/4"	4' 8"

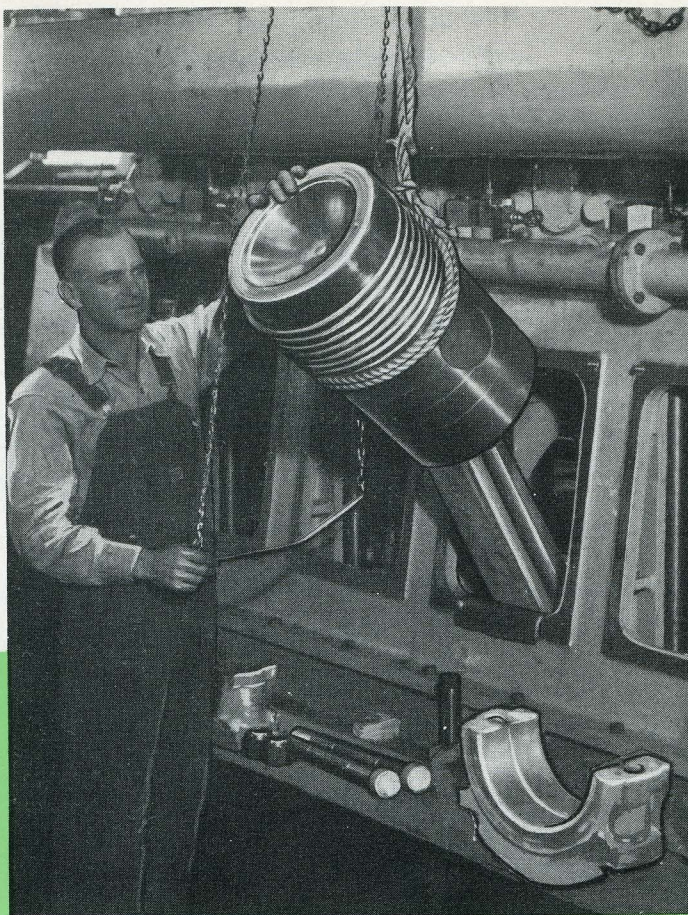
GENERAL DIMENSIONS

WASHINGTON DIESEL ENGINES

STATIONARY ENGINES



MODEL	A	B	C	D	E	F	G	H	J	K	L	M
3S125	7' 8½"	5' 6"	3' 1½"	16½"	14½"	2' 3"	11½"	8¼"	4"	8"	6' 0¾"	18"
4S125	9' 0¼"	5' 6"	3' 1½"	16½"	14½"	2' 3"	12¾"	8¼"	4"	8"	7' 3¼"	18"
5S125	10' 2¾"	5' 6"	3' 1½"	16½"	14½"	2' 3"	12¾"	8¼"	4"	8"	8' 5¾"	18"
6S125	11' 5¼"	5' 6"	3' 1½"	16½"	14½"	2' 3"	12¾"	8¼"	4"	8"	9' 8¼"	18"
8S125	13' 10¼"	5' 6"	3' 1½"	16½"	14½"	2' 3"	12¾"	8¼"	4"	8"	12' 1¼"	18"
3S13	8' 7"	5' 10¼"	3' 4"	18"	16½"	2' 4"	13¾"	7¾"	5"	3"	6' 9½"	21"
4S13	10' 1½"	5' 10¼"	3' 4"	18"	16½"	2' 4"	13¾"	9¾"	5"	3"	8' 2"	23"
6S13	12' 7½"	5' 10¾"	3' 4"	18¼"	16½"	2' 4"	13¾"	4½"	5"	3"	11' 1¼"	19"
8S13	15' 4½"	5' 10¾"	3' 4"	18¼"	16½"	2' 4"	13¾"	4½"	5"	3"	13' 10¼"	19"
4S15	10' 10¾"	6' 6¼"	3' 10"	21"	18½"	2' 6"	13"	6½"	5"	4"	9' 3¼"	22½"
6S15	13' 9½"	6' 6¼"	3' 10"	21"	18½"	2' 7¼"	14¼"	6½"	5"	4"	12' 0¾"	19"
8S15	16' 10½"	6' 6¼"	3' 10"	21"	18½"	2' 7¼"	14¼"	6½"	5"	4"	15' 1¾"	19"
6S160	15' 3"	7' 1"	4' 2"	21½"	20¼"	2' 11"	15⅝"	4⅞"	5"	4"	13' 7"	22"
8S160	18' 7½"	7' 1"	4' 2"	21½"	20¼"	2' 11"	15⅝"	4⅞"	5"	4"	16' 11½"	22"
6S18	17' 11½"	7' 10½"	4' 8"	2' 2"	23½"	3' 5"	18½"	6"	6"	4¼"	15' 11"	2' 4"
8S18	21' 10½"	7' 10½"	4' 8"	2' 2"	23½"	3' 5"	18½"	6"	6"	4¼"	19' 10"	2' 4"
6S20	19' 10"	8' 11"	5' 1"	2' 2"	2' 4½"	3' 6"	18"	9"	6"	5"	17' 7"	21"
8S20	24' 7"	8' 11"	5' 1"	2' 2"	2' 4½"	3' 6"	18"	9"	6"	5"	22' 4"	21"



The WASHINGTON Diesel Engines are designed and built so that they may occupy a limited operating space.

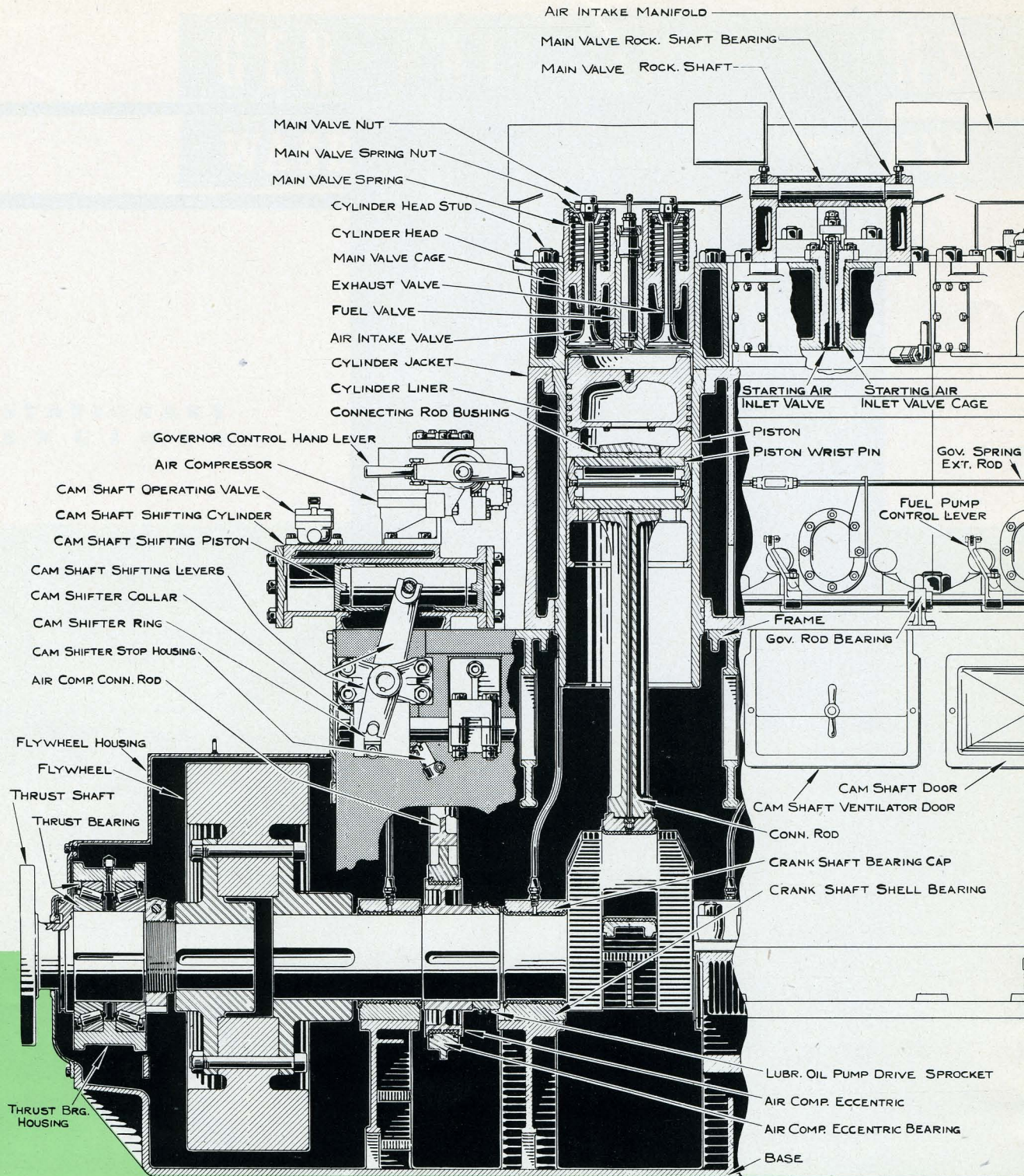
Pistons can be removed through doors on the side of engine. It is not necessary to remove the cylinder heads or drain water from cooling system.

WASHINGTON

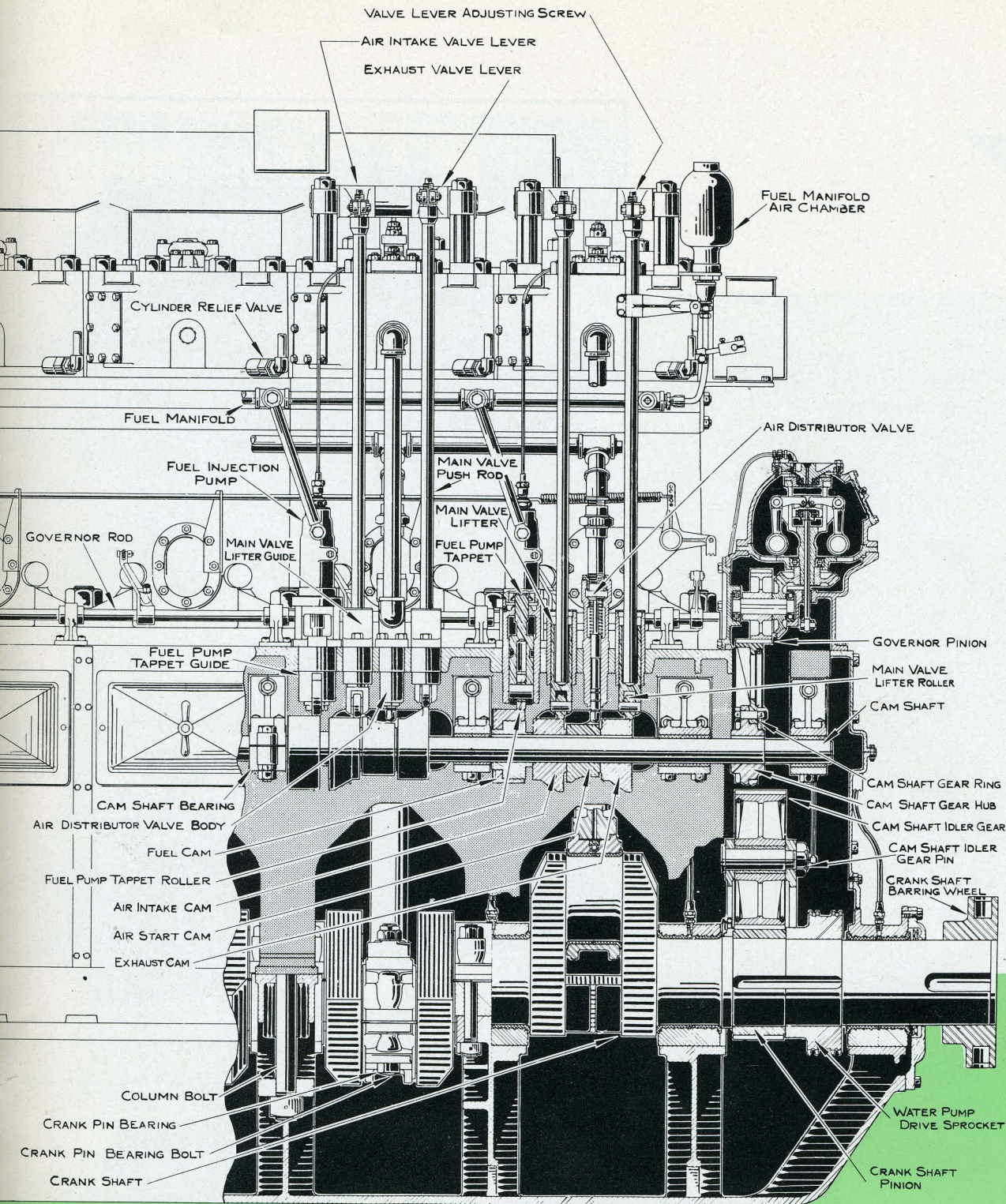
DIESEL

ENGINES



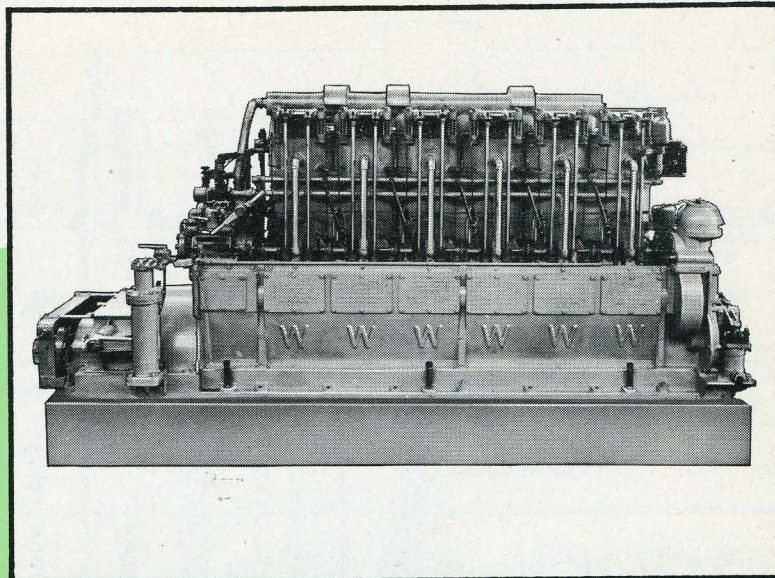


SECTION---DIRECT REVERSING WASHINGTON DIESEL ENGINE

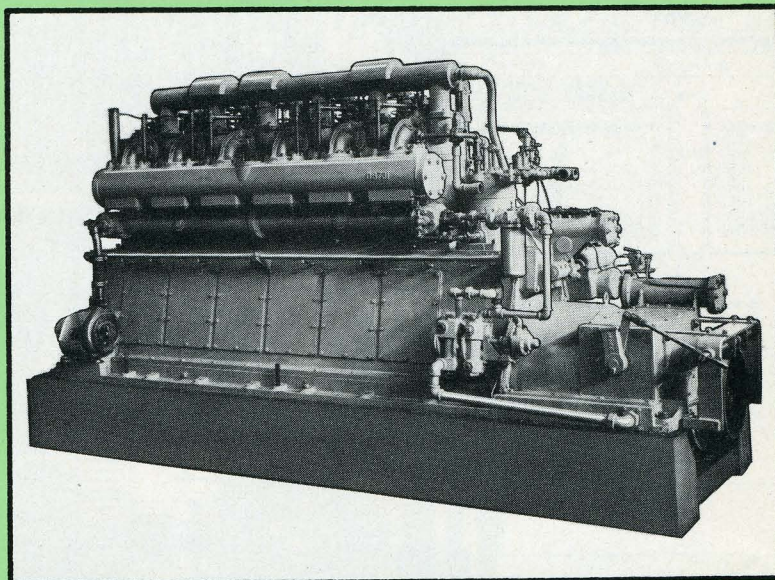




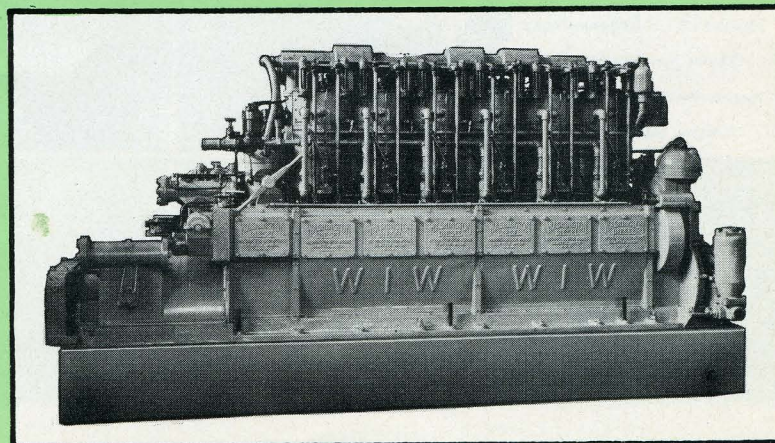
Model 6-R-13C Direct Reversing Marine Diesel showing air-operated sailing clutch and clutch brake

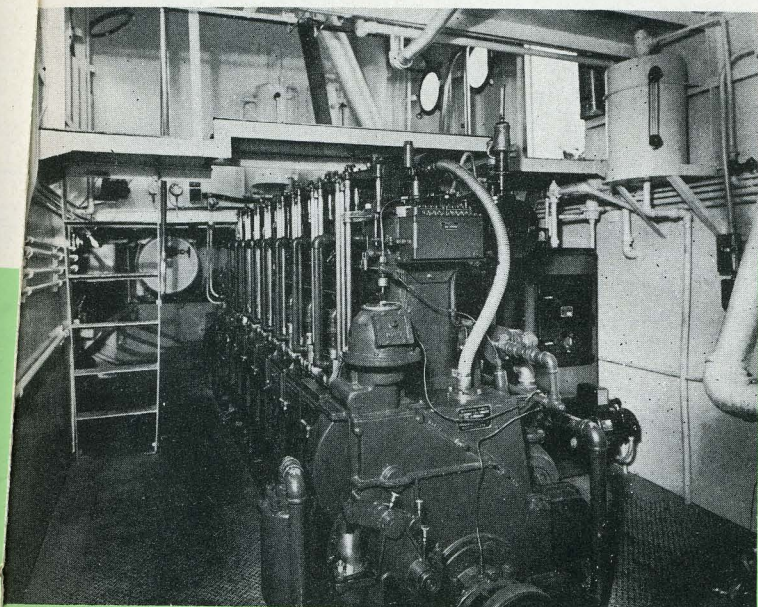


Manifold side of 180 H.P. engine shown below

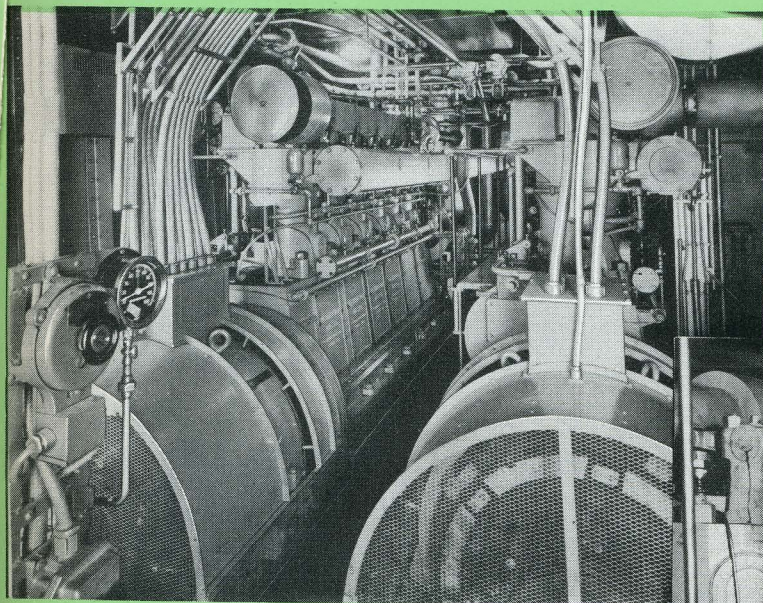


Operating side of 180 H.P. Direct Reversing Marine Diesel engine with sailing clutch





**8-cylinder, 320 H.P.
Diesel installation in a
tug boat**



**Two 250 K.W. Gener-
ating Units installed in
freighter**

**300 H.P. Diesel engine
installed in a fishing
vessel**



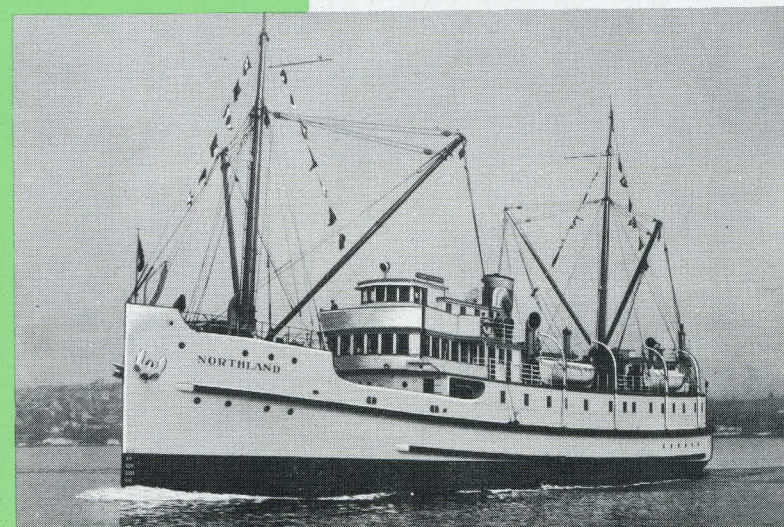
Sea-going Yacht



**Double end type auto
and passenger ferry**



**Twin screw freight and
passenger boat**



Navy Tug



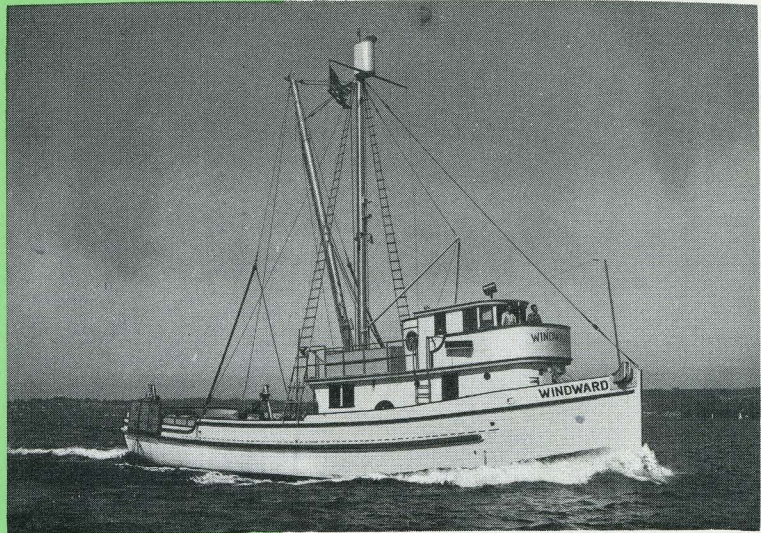
Purse Seine type fishing vessel



Small freight and trading vessel



Combination type fishing vessel



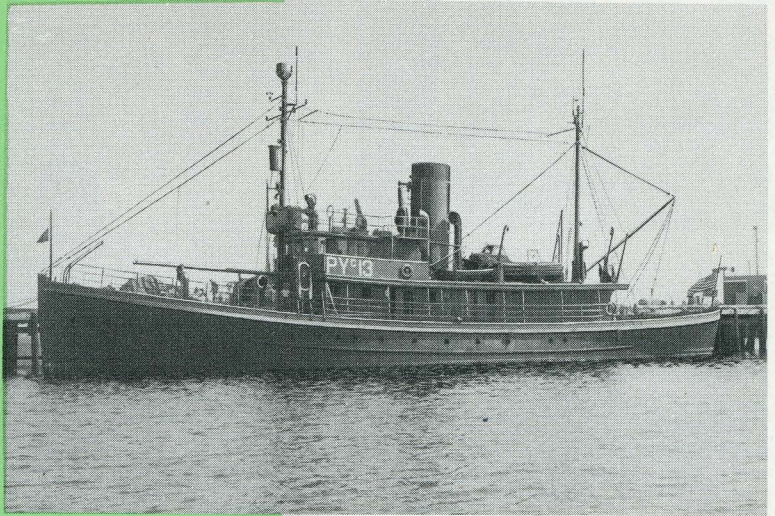
Halibut Schooner



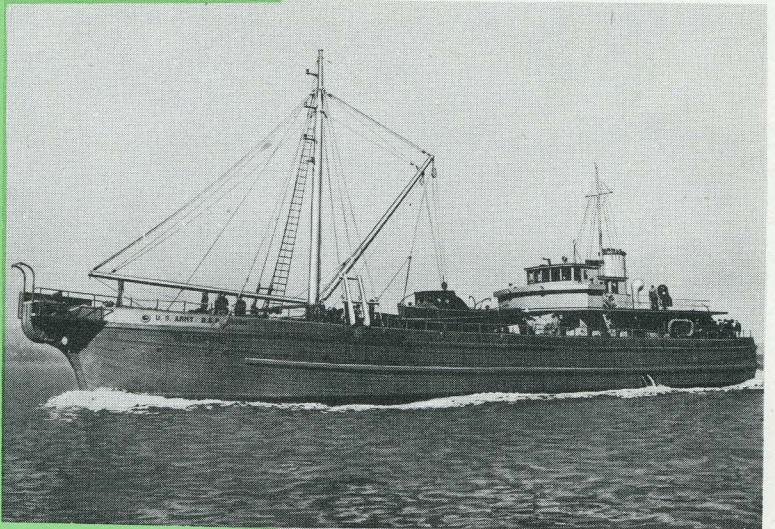
Tuna Clipper



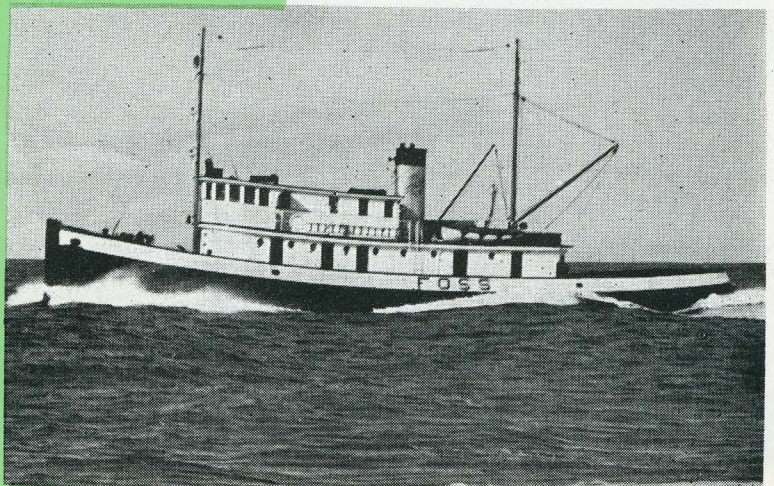
Yacht converted for wartime use by Navy for submarine detection experimental use



Cable-laying Ship

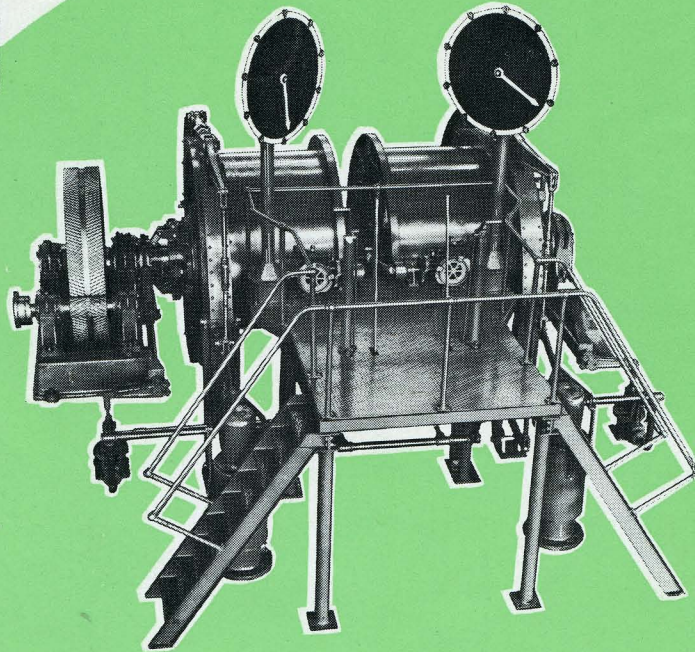


Sea-going Tug



OTHER WASHINGTON PRODUCTS

1. REVOLVING CRANES
2. MINE HOISTS
3. LOGGING ENGINES
4. GOLD DREDGES
5. CASTINGS

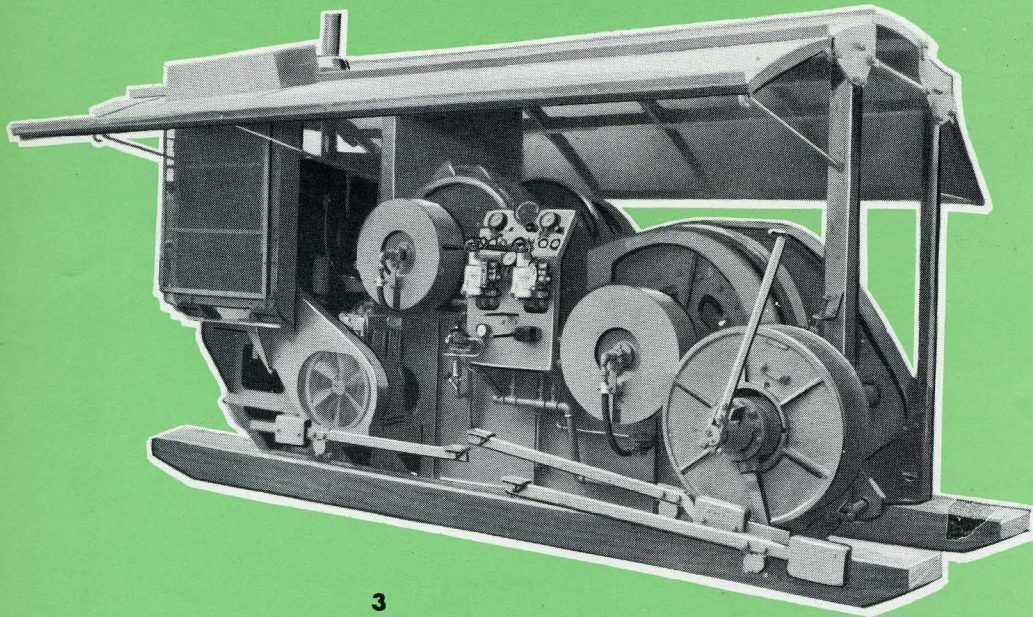


2



1





3



5



4

LIST OF PRODUCTS
 MANUFACTURED BY



DIESEL ENGINES ● Heavy duty type Diesel Engines from 90 to 1500 Horsepower for marine and stationary use.

LOGGING EQUIPMENT ● Diesel, gasoline, steam, or electric powered . . . sled or crawler mounted . . . Yarders . . . Loaders . . . Tower and Tree Skidders . . . Flyers . . . Blocks . . . Fairleaders . . . Chokers . . . Hooks . . . Tongs . . . Rigging Equipment.

CRANES ● Portal Type Revolving Gantry . . . Hammerhead and "T" Head Type . . . Barge Type . . . Level Luffing Type Cranes . . . full electric or diesel electric or full mechanical drives.

Stiff Leg . . . Guy . . . "A" Frame Derricks . . . Wood Derrick Irons for all types of work.

CONSTRUCTION EQUIPMENT ● Hoisting and Conveying Equipment . . . Material Skips and Elevators . . . All types of Heavy Duty Hoists . . . Pile Driver Equipment . . . Cableway Systems complete . . . Slackline Excavating Systems and Buckets . . . Dragline Scrapers.

MINING EQUIPMENT ● 1½ cubic foot to 15 cubic foot capacity Dredges for gold, tin, and platinum . . . Dry Land or floating type Gold Washing Plants . . . Mine Hoists of any capacity . . . Aerial Tramways . . . Ball Mills . . . Cement Mill Equipment.

MISCELLANEOUS ● Pulp and paper mill machinery

Heavy industrial equipment

Special machinery designed, engineered, and manufactured

Boilers, boiler parts and repairs

Pressure vessels and tanks, welded or riveted

Structural steel and plate work

Steel castings

Meehanite Iron Castings

Manganese and alloy steel castings

Patterns

Forgings

Heat treating, Annealing and Normalizing

Complete machine work facilities



The
SIGN
of

DEPENDABLE

EQUIPMENT

Since 1882